REMARKS/ARGUMENTS

Reconsideration is requested in view of the following remarks. Claim 1 has been editorially revised. Support for the editorial revision of claim 1 can be found in Figures 1, 4, 5A and 5B. Claims 1 and 4-14 remain pending in the application.

Claim Rejections – 35 USC §103

Claims 1 and 4-14 are rejected under 35 U.S.C. §103(a) as unpatentable over Ohuchi (US 6,590,287) in view of Yamaguchi et al. (US 6,930,388). Applicants respectfully traverse this rejection.

The rejection asserts that the members denoted by reference numerals "3" and "4" (first resin 3, second resin 4), the bumps 5 and the solder 2 shown in Figures 1(a) and 6(d) of Ohuchi constitute parts of the wiring substrate 1. This assertion is not correct. As seen from the description of Figures 3(a) to 3(e') at column 8, line 66 to column 9, line 55 of Ohuchi, member 1 is identified clearly as the printed wiring substrate. The first resin 3, second resin 4, bumps 5 and solder 2 are therefore not constituent parts of the wiring substrate 1.

Ohuchi discloses that electrodes 8 and pads 7 are disposed on the wiring substrate 1 and are connected with one another via bumps 5 and solder 2. In contradistinction, the invention of claim 1 recites the electrode parts and the electrode-part-connection electrodes are connected by a metal joint. The metal joint connection recited in claim 1 is different from the connection disclosed by Ohuchi in that such a metal joint connection does not require the use of bumps 5 or the like being provided there between.

Further, the semiconductor element 6 and the wiring substrate 1 of Ohuchi are bonded to one another via the first resin 3 and the second resin 4. In contradistinction, the semiconductor element and the wiring substrate of claim 1 are bonded directly with each other.

Further, the semiconductor device of claim 1 recites a surface of the wiring substrate on a semiconductor element side and a surface of the semiconductor element on a wiring substrate side are bonded directly with each other so that spaces between the

electrode parts are filled with the insulation layer. An example of such a configuration is clearly shown in the embodiment of Figure 1 that shows a semiconductor element 103 that includes an element body part 105 and electrode parts 104 protruding out of the body part 105, and a wiring substrate 108 and that are physically and electrically connected directly to one another in such a way as to avoid any gaps there between. Claim 1 further recites that a surface of the electrode-part-connection electrode defines a smooth surface with adjacent portions of a surface of the wiring substrate on a semiconductor element side, and the surface of the wiring substrate on the semiconductor element side is recessed at a position where the electrode-part-connection electrode is provided. Figures 1 and 12A clearly show that a semiconductor element side surface of the wiring substrate 108 is recessed at positions where the electrode-part-connection electrodes 102 are provided. This claimed structure is nowhere disclosed nor suggested by Ohuchi. In fact, Ohuchi discloses that a gap between the wiring substrate and the semiconductor element is filled with members other than the wiring substrate (i.e., first resin 3, second resin 4). In view of the foregoing, it is not possible to achieve the structure of claim 1 from the teachings of Ohuchi in which the semiconductor element side surface of the wiring substrate is recessed at positions where the electrode-part-connection electrodes are provided without improperly using Applicants' disclosure as a template for doing so.

The rejection further asserts that Yamaguchi et al. discloses an insulation layer 5 having an elastic modulus range of 0.1 GPa to 10 GPa. The insulation layer 5 however, is a layer disposed on a wafer. Wiring is provided on the layer 5, and a bump 1 is formed at a predetermined position on the wiring (See Fig. 1, etc). Therefore, the insulation layer 5 is completely different from the insulation layer as a part of the wiring substrate of the claimed invention or Ohuchi. One skilled in the art would therefore not be motivated to change the elastic modulus of the insulation layer comprising the wiring substrate disclosed in Ohuchi to the elastic modulus of the insulation layer 5 disclosed in Yamaguchi et al. Further, even if the elastic modulus of the wiring substrate of Ohuchi is changed to the elastic modulus of the insulation layer 5 disclosed in Yamaguchi, the semiconductor device disclosed in Ohuchi has a configuration completely different from that of the semiconductor device of claim 1, as described herein above (i.e., the electrode

part and the electrode-part-connection electrode are not directly connected). Further, the semiconductor element and the wiring substrate disclosed in Ohuchi are not directly bonded. Further, the semiconductor element side surface of the wiring substrate disclosed in Ohuchi is not recessed at positions where the electrode-part-connection electrodes are provided. Therefore, even if the configuration of Ohuchi is combined with the configuration of Yamaguchi et al., the result would be a configuration completely different than that recited by claim 1.

Claim 1 further recites the insulation layer has an elastic modulus of not less than 0.1 GPa and not more than 5 GPa. Table 1 of the specification explicitly discloses that better thermal shock test results were obtained when the elastic modulus was not more than 5 GPa, as compared with cases where the elastic modulus was more than 5 GPa. Further, if the elastic modulus is less than 0.1 GPA, a semiconductor device in which a wiring substrate includes such an insulation layer is difficult to handle (page 16, lines 8-10 of the specification).

Favorable reconsideration in the form of a Notice of Allowance is requested. If the Examiner believes a telephone conference would advance the prosecution of this application, the Examiner is invited to telephone Applicants' primary attorney-of-record, Douglas P. Mueller (Reg. No. 30,300), at (612) 455-3804.

Respectfully submitted,

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